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CHAIR

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(57) Claim

1. A chair comprising a base, a seat, a gas-spring for adjusting the altitude of the seat with respect to the base, a telescopically extendable member mounted to one end of the gas-spring, and means adapted in use for releasably locking the telescopically extendable member in an extended position.

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Complete Specification for the Invention entitled:

"CHAIR"

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

(Complete of Provisional Specification No. PJ0022 dated 23/8/88.)

This invention relates to a chair and more particularly to a chair which is adjustable in altitude over a range which enables it to be used both as a typist's chair and as a draughtsman's chair.

It is usual for a typist or office worker to be provided with a chair whereof the seat height is adjustable to provide for maximum comfort of the user in relation to a desk. Typists' chairs desirably incorporate a gas spring mechanism by means of which the seat may conveniently be elevated or lowered in relation to a base. Gas springs are well known in the art and require no further detailed description.

It is well known that the stroke of, and hence range of vertical adjustment provided by, a gas spring is governed by the cylinder length and other constraints. In a typical typists' chair, the gas spring has a cylinder length of say 310mm, an overall retracted length of about 370mm and a fully-extended length of about 570mm providing an extension range of about 200mm. The seat height is thus adjustable from a lower-most altitude of about 370 mm to an upper-most altitude of about 570mm or, as is more usual in practice, from a lower-most altitude of about 450mm to an upper-most altitude of about 650mm. It is desirable that a draughtsman's chair be adjustable to at least 750mm and the above described chairs are not suitable for such use. Gas springs have also been provided for height adjustment of draughtsmen's chairs. For a draughtsmen's chair the gas spring is mounted on an

elevated base and is adjustable from a lower-most altitude of 550mm to an upper-most altitude of about 750mm. Alternatively, a gas spring may be used which has a fully-extended length of about 750mm but in that case the fully-retracted length is in excess of 500mm whereas adjustability down to or below 450mm is desirable for a typist's chair.

An object of the present invention is to provide a chair including a gas spring in which the seat altitude is adjustable over an extended height range, for example from 450mm to 750mm.

A further object of the invention is to provide a chair suitable for use both as a typists' chair and as a draughtsmen's chair and in which both seat altitude and foot-rest altitude are conveniently adjustable.

According to one aspect, the invention consists in a chair comprising a base, a seat, an gas-spring for adjusting the altitude of the seat with respect to the base, a telescopically extendable member mounted to one end of the gas-spring, and means adapted in use for releasably locking the telescopically extendable member in an extended position.

In preferred embodiments, the telescopically extendable member is a hollow pedestal in which the cylinder of the gas-spring is sleeved, the cylinder of the gas-spring being slideably and rotatably mounted to the hollow pedestal. The cylinder is provided with a radially projecting stud which extends through a slot

disposed longitudinally of the hollow pedestal. At the lower end of a range of telescopic movement of the cylinder with respect to the pedestal, the stud abuts one end of the slot. At its upper end, the slot extends laterally, that is to say in a circumferential direction of the pedestal, whereby the cylinder may be retained at a fully-extended position with respect to the pedestal by a twisting action in the manner of a bolt or bayonet fitting which engages the stud in the lateral slot thus preventing telescopic contraction of the parts.

In a preferred embodiment, the slot extends laterally at its upper end and intermediate of the ends of the slot, in a circumferential direction of the pedestal, whereby the cylinder may be retained at one of two positions being a fully-extended position and a partially extended position with respect to the pedestal by a twisting action in the manner of a bolt or bayonet fitting which engages the stud in the lateral slot. It is envisaged that the slot may extend laterally at any number of positions.

In preferred embodiments, the chair is provided with a foot-rest including a cylindrical boss formed to sleeve the pedestal and adapted to engage the radially projecting stud whereby the foot-rest may be raised or lowered in concert with telescopic extension.

A preferred embodiment of the invention will now be described by way of example only with reference to the accompanying drawings wherein:-

Figures 1, 2 and 3 show a chair according to the invention at various stages of extension;

Figure 4 shows a portion of the first embodiment of Figure 1 according to the invention in elevation, partly sectioned;

Figure 5 shows a section of the embodiment of Figure 4 taken on line S - S;

Figure 6 shows a cylindrical portion of the foot-rest of Figure 1 in more detail;

Figure 7 shows the part of Figure 6 in its developed form.

Figure 8 shows a cylindrical portion of the pedestal of Figure 1 in more detail.

Figure 9 shows the part of Figure 8 in its developed form.

Figure 10 shows a cylindrical portion of the pedestal in accordance with a further embodiment of the present invention.

With reference to Figures 1 to 9 there is shown a chair base 1 comprising an axially bored cylindrical boss 10 provided with laterally extending legs 11 fitted with castors 12. A hollow cylindrical pedestal tube 2 is mounted to boss 10, the bore of boss 10 sleeving tube 2 at lower tube end 23 which is welded to boss 10.

With reference to Figures 4 and 5, a gas-spring assembly 3 comprising a cylinder 31, a piston 32, and an actuator 33 is telescopically nested within pedestal tube 2 projecting from upper end 24 of tube 2.

Cylinder 31 is slideably and rotatably mounted to tube 2 by means of an upper nylon bush 25 and a lower nylon bush 26.

Cylinder 31 has a radially projecting stud 34 which passes through slot 27 extending longitudinally of wall 21 of pedestal tube 2. Slot 27 communicates at its upper end with a laterally directed slot 28 which preferably has a downwardly extending slot portion 29 spaced laterally from slot 27.

Figure 10 represents an embodiment of slot 27 whereby slot 27 extends laterally both at the end of slot 27 to create a laterally directed slot 28 and intermediate of the ends of slot 27 to create a further laterally directed slot 28a which slots 28 and 28a preferably have downwardly extending slot portions 29 and 29a spaced laterally from slot 27.

A chair or seat 34 is mounted to the piston 32 of gas-spring 3 by conventional means not illustrated in Figure 1, and a lever 41 or the like is provided for control of actuator 33 by a person using the seat.

In operation, the seat has a lower-most position as shown in Figure 1 in which piston 32 is fully retracted in cylinder 30 of gas-spring 3 which in turn is telescopically retracted into pedestal tube 2 and stud 34a engages the lower end of longitudinal slot 27.

The gas-spring may be actuated to raise the seat to a position as shown in Figure 2 in which gas-spring piston 32 is fully extended from air spring cylinder 30.

Any intermediate position may be conveniently obtained by control of gas-spring actuator 33 in the usual manner. The range of movement is sufficient for use of the chair as a typists' chair or office chair.

If it is desired to use the chair as a draughtsmens' chair, cylinder 30 may be telescopically extended from pedestal tube 2 until stud 34a reaches the upper extent of slot 27. The cylinder may then be rotated so that the stud moves arcuately in slot 28 and is allowed to engage into slot 29 as shown in Figure 3. The lower end of gas-spring 3 is thereby raised and a further range of height adjustment appropriate for a draughtsman's chair is thus provided. In Figure 3 gas-spring piston 32 is also shown as fully extended relative to cylinder 30.

Chairs according to the invention are adjustable in height from 450mm as high as 750mm in preferred embodiments.

A foot-rest 40 consisting of a foot-rest hub 41 having arms 42 extending radially to connect with a circular foot-rest 43. Foot-rest hub 41 is a hollow cylinder and is provided with longitudinally-extending slots 44, 45, 46, each extending from the lower edge 47 of hub cylinder 41 in the axial direction and each being of length different from each other. Hub cylinder 41 has an internal diameter adapted to sleeve pedestal 2 and the blind end 48 of any one of slots 44, 45, 46 may be engaged with stud 34a by raising and rotating foot-rest 40 with respect to pedestal tube 2. In Figure 4 the

foot-rest is shown with slot 44 engaging stud 34a. The height of the foot-rest above the base depends upon which of slots 44, 45, 46 is engaged with stud 34a and also on whether the stud is in its raised or lowered position with respect to slot 27 of pedestal tube 2. Likewise, the foot-rest may be used, after raising stud 34 to the upper end of slot 29 or slot 27 to assist in rotating cylinder 30 within pedestal tube 2.

The base 1 and the seat 34 may be provided in a variety of forms. The seat may be equipped for adjustment in other respects, for example tilt, etc. Likewise, the foot-rest need not be of circular shape. Although the invention has been herein described in relation to an embodiment wherein the cylinder of the gas-spring is telescopically sleeved within a pedestal tube, it will be apparent that in other embodiments, the telescopic extension may be provided at the piston end of the gas-spring. The cylinder need not itself be sleeved within the pedestal base but may be mounted to a member which is telescopically extendable with respect to the pedestal or another suitable part.

Suitable gas-springs for use in the invention are obtainable from SUSPA or STABILUS.

As will be apparent to those skilled in the art from the disclosure hereof, the invention may be embodied in other forms without departing from the scope of the invention disclosed.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A chair comprising a base, a seat, a gas-spring for adjusting the altitude of the seat with respect to the base, a telescopically extendable member mounted to one end of the gas-spring, and means adapted in use for releasably locking the telescopically extendable member in an extended position.
2. A chair in accordance with Claim 1, wherein the telescopically extendable member is a hollow pedestal in which the cylinder of the gas-spring is sleeved, the cylinder of the gas-spring being slideably and rotatably mounted to the hollow pedestal.
3. A chair in accordance with any one of Claims 1 or 2, wherein the cylinder is provided with a radially projecting stud which extends through a slot disposed longitudinally of the hollow pedestal.
4. A chair in accordance with any one of Claims 1, 2 or 3, wherein the chair is provided with a foot-rest.
5. A chair in accordance with Claim 4, including a cylindrical boss formed to sleeve the pedestal and adapted to engage the radially projecting stud whereby the foot rest may be raised or lowered in concert with telescopic extension.

6. A chair in accordance with any one of the foregoing claims with reference to the drawings.

DATED this 21st day of August 1989

STURDY COMPONENTS PTY. LIMITED

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Fellow Institute of Patent Attorneys of Australia
of SHFLSTON WATERS

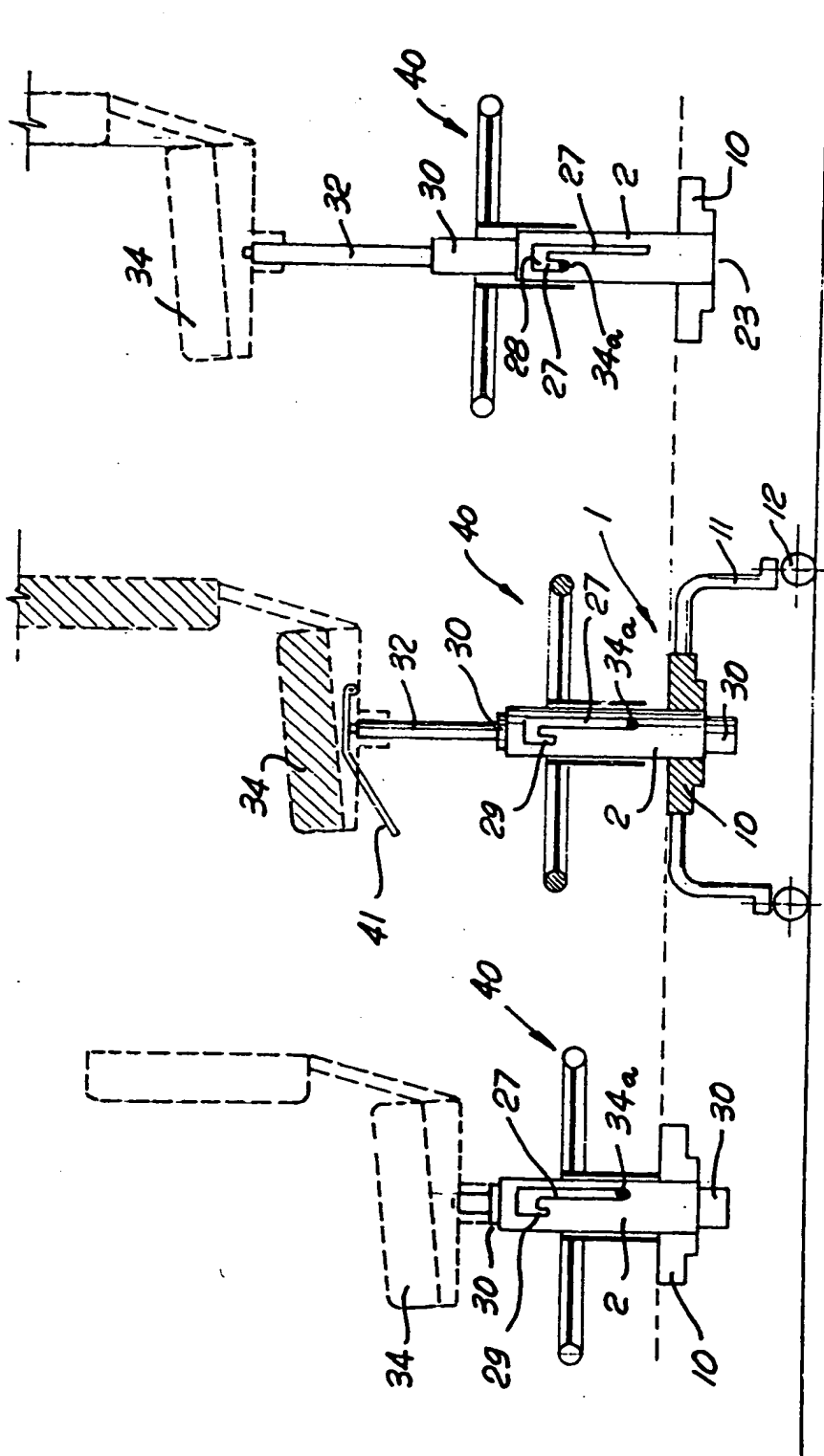


FIG. 3

FIG. 2

FIG. 1

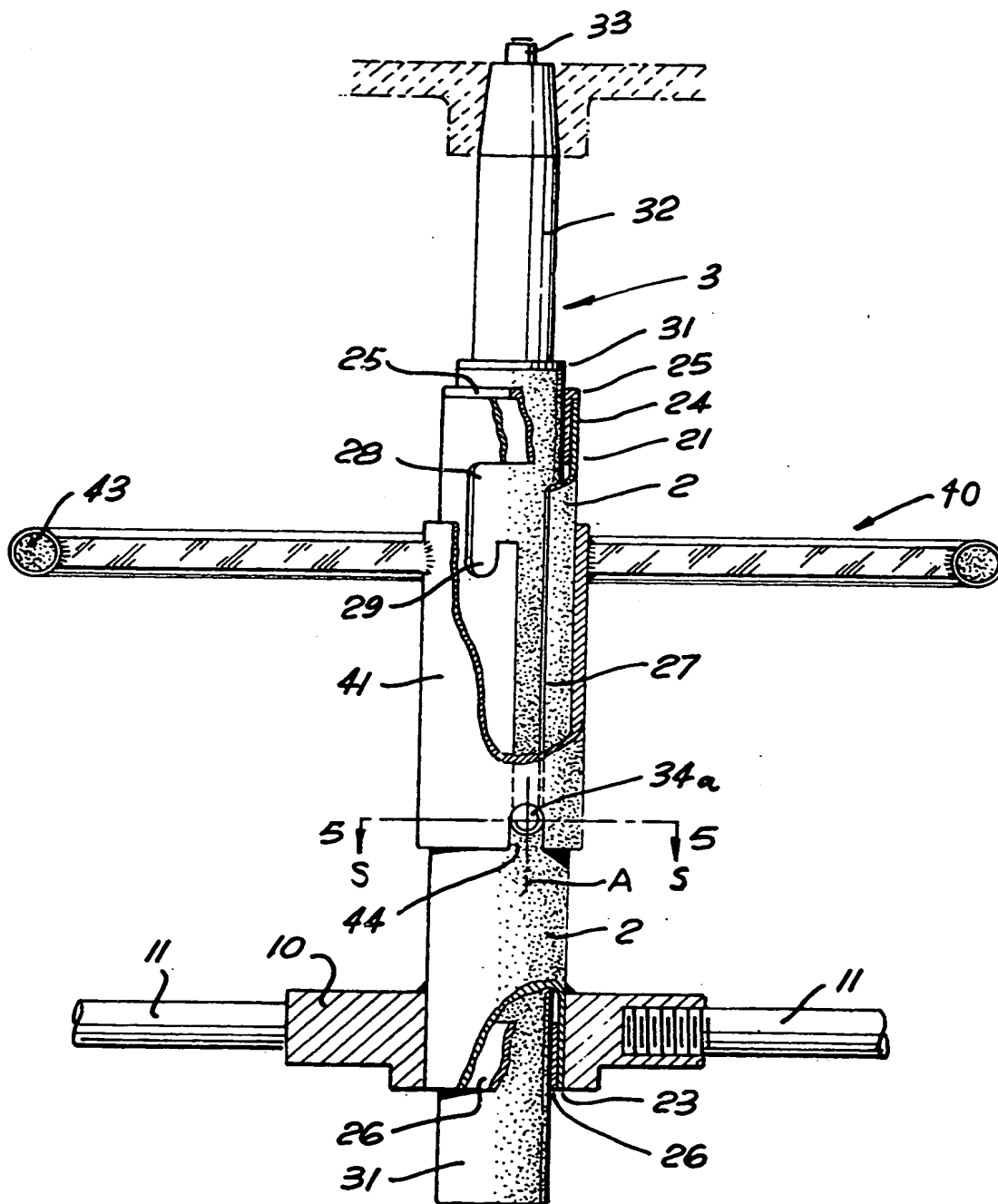


FIG. 4

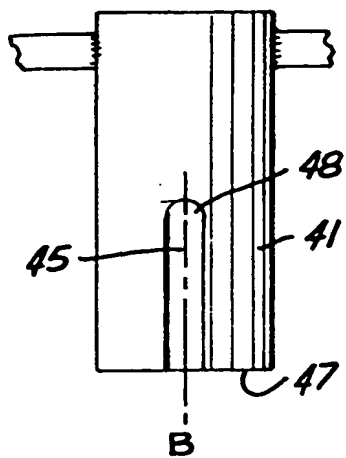


FIG. 6

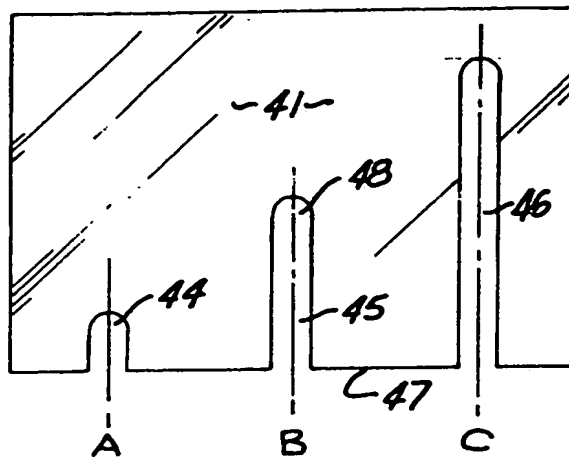


FIG. 7

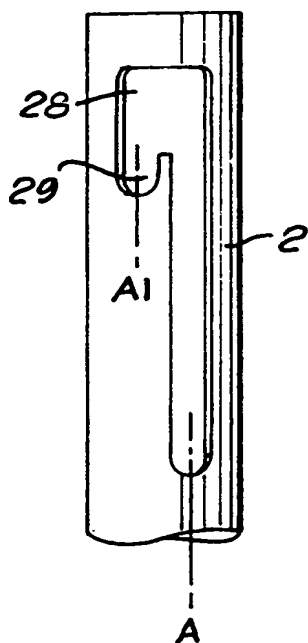


FIG. 8

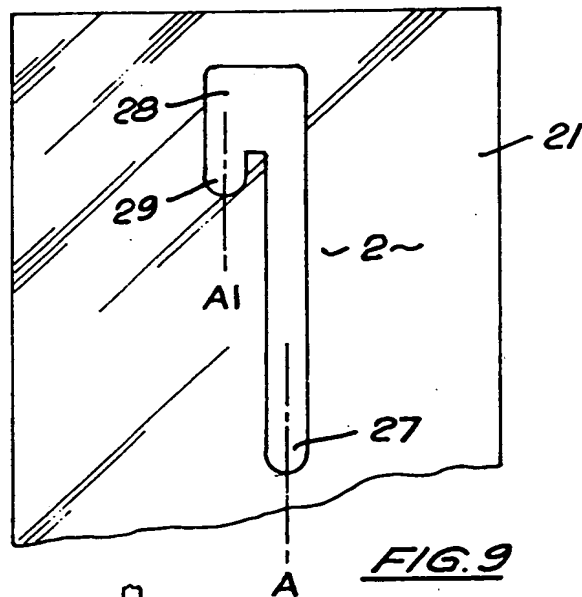


FIG. 9

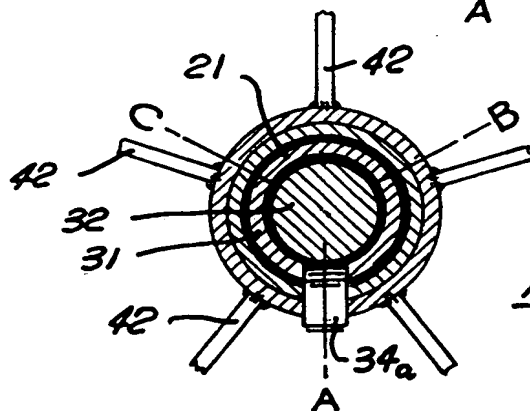


FIG. 5

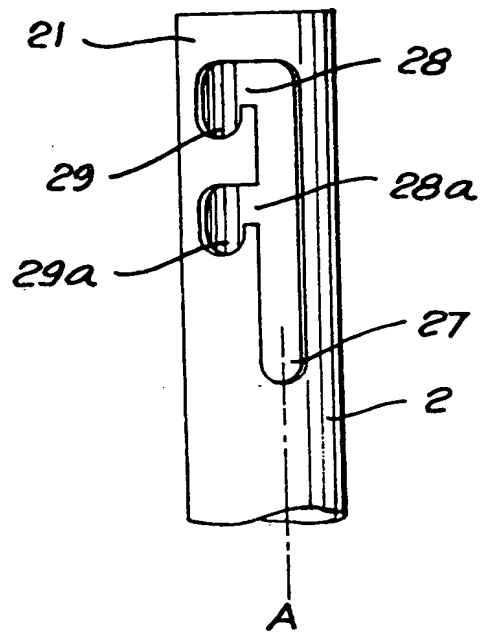


FIG. 10

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